

he was showing the present writer some of the tablets he had found, when a lady and gentleman came up and asked various questions, to which he replied with his usual courtesy. They thanked him and were turning away when, hearing his name pronounced, the lady asked: "Are you Mr. Smith?" On his replying "That is my name, madam," she exclaimed, "What, not the great Mr. Smith!" and then, like the gentleman with her, insisted upon having "the honour" of shaking hands with the distinguished Assyriologue, while the latter crimsoned to the roots of his hair. His loss is an irreparable one to Assyriology, even beyond his powers as a decipherer, as his memory enabled him to remember the place and nature of each of the myriad clay fragments now in the Museum, while his keenness of vision made his copies of the minute characters of the tablets exceptionally trustworthy. It is distressing to think that he leaves behind him a wife and large family of small children, the youngest of whom was born but a short time before his last departure from England.

A. H. SAYCE

THE NORWEGIAN TOURISTS' ASSOCIATION

Year-book of the Norwegian Tourists' Association for 1875 (Den Norske Turistforenings Årbog for 1875.)
(Kristiania: Cammermeyer).

THIS year-book, which is the eighth of a series issued by the Association, contains some information likely to be useful to those who intend to visit the fjelds of Norway, and two papers at least of scientific interest by Mr. A. Helland. The indefatigable mountain-climbers, Mr. E. Mohn and Mr. Wm. Cecil Slingsby, have each contributed a paper on their adventures during short excursions made on the Jotunheim-fjeld ("Adventures on the Fjelds," and "An English Lady in Jotunheimer"). These accounts, written in a lively, pleasant style (the last in English), will be read with interest by tourists who are in search of new fields of exploration. In the paper of O. A. C. "Bagatelles from a Journey in the Nordland," the reader will find some fine description of nature and life in the northern parts of the Scandinavian peninsula.

The paper by Mr. A. Helland, "On 'Cirques' and Sack-valleys,"¹ and on their importance in the theories of the Formation of Valleys,² will certainly be perused with profit by the geologist.³ After a description of cirques and sack-valleys, and of the forms intermediate between the two, Mr. Helland remarks that the openings of the cirques are generally directed towards the north. This law, he says, is well illustrated by a large scale map of the Jotunfjelds, constructed by Capt. Hertzberg; and from a table, in which the author gives the directions of thirty-seven cirques of different magnitudes (from 0.3 to 4 kilometres long), it is seen that twenty-five cirques are directed towards points lying between north-west and north-east, eleven between north-west and south-west or north-east and south-east, and one points towards the south-east. Certainly in other localities there are cirques

pointing even due south, but these are only exceptions to the general rule. Besides, when a valley has a west-east direction, or when the slope of a fjeld follows this direction, it is on the slope which faces to the north that semi-circular indentations or little cirques are found.

A second law which may be established for the cirques of the parts of Norway explored by the author, is, that the largest are generally found in the neighbourhood of the highest peaks of the country.

As to the origin of the cirques, Mr. Helland refers to a note of Mr. Lorange, which he gives *in extenso*, and in which the author, though not a geologist by profession, makes some very valuable observations on the cirques, on their close relations with glaciers, existing and extinct, and with old moraines. His notes on the transport of blocks from the interior of the cirques, and on the directions of their transit, show how important was the part played by ice in the excavation or in the clearing of cirques. The conclusions arrived at by Mr. Lorange, and supported by Mr. Helland are, that cirques, as well as sack-valleys, were necessarily excavated with the aid of glacier-ice. But the ice did not act as a direct excavating agent; it only cleared away the *débris* which had accumulated in the cirques, the rock being disintegrated by the incessant intermittence of the freezing and thawing of water in the fissures. Doing little to excavate the valley, the glacier acts as a powerful means of transport of the disintegrated parts of the rock, where such a means is wanting, as on the tops of mountains, there the *débris* accumulates and protects the underlying rock from further disintegration. The tarns, so numerous at the bottoms of cirques and of sack-valleys, were formed, the author supposes, by the same process, the rocks being disintegrated when the water freezes under the glacier during winter. This theory of the transport power of glaciers is supported by some authorities in England, but we think that it meets with two great difficulties. It is in contradiction with the well-known fact, that in the valleys of the Alps the ice has acted as a sheet, protecting the rock from disintegration; that the disintegration proceeds far more rapidly above the glacier than beneath it. And secondly, the theory does not explain why the disintegration should go on so rapidly in the head of the valley and so slowly in its lower parts (the differences of height and climate being trifling), as to produce a very great semi-circular enlargement at the head of the valley. We believe, therefore, that so long as it is not admitted that a glacier, charged on its lower surface with a mass of *débris*, is really a mighty excavating agent, we cannot come to a satisfactory explanation of the cirques. The observation of Mr. Helland that the openings of the cirques are generally directed to the north, *i.e.* to the part of horizon from which came the ice in many instances, suggests a question which we will simply refer to without entering into details. Were not some cirques, or a part of the enlargements of some cirques, excavated by the ice during its ascending motion from the valley on the fjeld? Those who accept the molecular motion of glacier-ice, *i.e.* its perfect plasticity or viscosity, with all the consequences of this theory, certainly will not find the question extravagant; they will remember that the motion of ice *up* the valleys, and even a motion on slopes from 20° to 63° is an established fact.

¹ "Om botner og sækkedal, samt deres betydning for teorier om dalenes dannelse." A "botn," a semi-circular indentation in the mass of the field, is what is called in the Alps a "cirque." A "sækkedal," *i.e.*, a valley, the head of which presents a semi-circular enlargement, or a "cirque," a valley which ends in a *cul-de-sac*, might be called a "sack-valley," a literal translation of the word "sækkedal."

² This paper is reprinted from the valuable periodical, *Geologiska Föreningens i Stockholm Förhandlingar*.

In the valleys which have, for example, a west-to-east direction, and which were crossed by the ice moving from north to south, the plastic ice *ascended* the slopes which faced towards the north; and also did it ascend on the fjelds when it moved *up* a valley, a phenomenon which, we know, is not at all uncommon.

A second short paper, by Mr. Helland, gives a table of the dimensions, heights above sea-level, and depths of twenty Norwegian lakes, from which it is seen that these lakes are, as in the case of the Italian lakes, deeply excavated below the sea-level; thus, for example, the bottoms of the Horningsdalvand and of the Mjösen lie respectively 432 and 331 metres below the level of the sea.

Without speaking of other short papers, we will note that the "Year-Book" contains some practical information on guides, on the regulations relative to hunting and fishing, and finally, the Annual Report of the Committee of the Society. It will be seen from this Report that the Association is rapidly developing; during 1875 the number of Fellows increased by 230, and reached, at the end of the year, the number of 1,247, of whom 166 are foreign Fellows, 63 belonging to England. A. L.

OUR BOOK SHELF

British Manufacturing Industries. Edited by G. Phillips Bevan, F.G.S. Shipbuilding, by Capt. Bedford Pim, R.N., M.P.; Telegraphy, by Robert Sabine, C.E.; Agricultural Machinery, by Prof. Wrightson; Railways and Tramways, by D. Kinnear Clark, M.Inst.C.E. (London: Stanford, 1876.)

THIS ought to be one of the most popular volumes of this instructive series, the contents are so varied, the subjects so generally interesting, and the amount of information conveyed so large. The various writers, moreover, have managed to treat their subjects in a manner that will be understood and enjoyed by even the most general readers. Capt. Pim is evidently quite at home in his subject, which he writes about in the spirit both of a sailor and a Member of Parliament. Of course only the merest sketch of so large a subject can be given in the space at his disposal, but in that space he contrives to convey a substantial amount of information, commencing with the log which conjecture makes the first form of boat, down to the latest armour-plated ship-of-war. He writes in rather a desponding tone of the present condition of British shipping, both in the merchant service and in the navy, and thinks our country behind others in modes of construction. Our navy is evidently far from perfect, and those who have its control, if they have also the welfare of our country at heart, would do well to weigh Capt. Pim's criticism. One of the surest remedies is undoubtedly the rigid application of scientifically-conducted experiment to shipbuilding. Mr. Sabine gives a very complete sketch of telegraphy as an industry, of the various forms of telegraph, their construction, the instruments in use, and the materials employed. He, too, indulges in some wholesome criticism, which those who provide the means for constructing telegraphs would do well to peruse. Prof. Wrightson (of Cirencester Agricultural College) gives a very instructive account of the multifarious machinery now used in the various operations by which agriculture is carried on, from clearing and ploughing the land to preparing crops and stock for market and consumption. Mr. Clark gives much valuable information on the construction and working of railways, showing the progress made since they were first started, describing some of the latest improvements and most

important enterprises, and entering into details as to cost, revenue, and other points, which all who are interested in railways will find useful. His short notice of Tramways is also interesting; their cost of construction will surprise many, if not the large earnings which they make. Altogether, the volume is one of varied and genuine interest.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

Miniature Physical Geology

UNDER this title there is a brief but very interesting article in *NATURE*, vol. xiii. p. 310, describing, among other things, some miniature earth-pillars at Bournemouth. These are due to the slight protection afforded by a hard seam in the sandy rock to a more friable layer beneath, when the whole is undergoing denudation by rain. It is a thing which I have seen more than once; but in the district of Luchon (Pyrenees) during the present summer, I have come across instances of earth pillars in miniature, yet more perfect than the above. The most striking case was on a slope in the wood on the right bank of the Cascade d'Enfer (Val de Lis). This slope consisted of a rather tenacious clay, filled with small angular fragments of granitoid rock. A slip, or the action of rain, had formed a little corrie half a yard or so wide, and on both sides of it the slope was studded with earth pillars, more or less perfect, each capped by its little stone. These caps were rather tabular in shape, generally from a quarter of an inch to an inch broad. Several of the pillars were so exactly models of those at Botzen, that, if drawn on the same scale, they could not be distinguished. The sides of the large pillars are furrowed and fluted by little rills of rain; so were these. Boulders smaller than the great capstone are imbedded in the matrix of the pillars, and, themselves exercising a protective influence are supported on brackets or pilasters of earth; so was it here; yet all this on the tiniest scale, for the largest and best-formed pillar had a general height of only about $1\frac{1}{2}$ inches, rising on one side about as much again above the bed of a miniature ravine. I also saw a large number of similar but more stumpy pillars by the side of the path from the Port de la Picade to the Hospice de France. T. G. BONNEY

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Visual Phenomena

THE letter of Mr. Arnulph Mallock (*NATURE*, vol. xiv. p. 350) has very much interested me, having recently found that my vision is an exception to that of other persons whom I have tested in the matter.

For instance, I see the light of *distant* street lamps clearly defined without any diverging rays proceeding from the points of light.

Possibly this peculiarity of vision may partly account for my having glimpsed the two outer satellites of Uranus with a refractor of only 4.3 inches in aperture, during the last opposition of the planet, and which caused some discussion when my observations were read before the Royal Astronomical Society.

I have also been successful in detecting very faint stars close to brighter ones with comparatively small telescopic aid.

I may remark that I am long-sighted, as I can read the columns of *NATURE* readily between the distances of twelve to thirty inches, though my more convenient reading distance is about sixteen inches.

It would be interesting to ascertain whether there are many such exceptions to the "visual phenomena" pointed out by Mr. Mallock. I. W. WARD

Belfast, Sept. 5

ALTHOUGH there can be little doubt that the explanation of the long streaks of light seen on examining a bright point through a half-closed eye, which is given in *NATURE*, vol. xiv. p. 350, is the right one, and may be proved to be so in other ways than those noted, yet I think the Fig. 5, which is supposed to represent the course of the rays of light, ought not to